

IN THE CLAIMS:

Please amend claims 1-3, 5, 6, 14, and 19. This listing of claims will replace all prior versions, and listings of claims in the application.

- 5 1. (Currently Amended) A storage system comprising:
- a plurality of front-end control ~~element~~ elements substantially devoid of circuits and functions that control a plurality of I/O devices and configured for controlling information exchange using RAID storage management with one or more attached host computer systems;
- 10 a plurality of back-end control ~~element~~ elements substantially devoid of circuits and functions that interface directly with the attached host computer systems, communicatively coupled to a plurality of I/O devices and configured for controlling information exchange with the I/O devices, wherein the front-end control elements differ in number from the back-end control elements; and
- 15 an interconnect element coupled to said front-end control ~~element~~ elements and coupled to said back-end control ~~element~~ elements to enable exchange of information therebetween, wherein the storage system is adapted to implement additional front-end control elements, back-end control elements and interconnect elements independent of all other such elements wherein the interconnect element is configured for conveying the requests from the front-end control elements to the back-end control elements to perform the host requested I/O operation, and
- 20 wherein said interconnect element is an SAN architecture fabric that conveys the requests from the front-end control elements to the back-end control elements by exchange of messages between the front-end and back-end control elements according to address indicia within the messages and associated with the front-end and back-end control elements.
- 25 2. (Currently Amended) The system of claim 1 further comprising:
- a plurality of disk drives coupled as I/O devices to said back-end control ~~element~~ elements.
3. (Currently Amended) The system of claim 2
- 30 wherein said plurality of disk drives comprises:
- a first subset of said plurality of disk drives; and

a second subset of said plurality of disk drives, and
wherein said ~~back-end control element comprises a plurality of back-end controllers~~
control elements including includes:

a first pair of back-end controllers coupled to said first subset; and
5 a second pair of back-end controllers coupled to said second subset.

4. (Original) The system of claim 3 further comprising:

a first pair of redundant links coupling said first pair of back-end controllers to said first
subset; and

10 a second pair of redundant links coupling said second pair of back-end controllers to said
second subset.

5. (Currently Amended) The system of claim 1 wherein said interconnect element
comprises a pair of interconnect elements and ~~wherein said front-end control element comprises~~
15 ~~a plurality of front-end controllers and~~ wherein each of said plurality of front-end ~~controllers~~
control elements is coupled to each of said pair of interconnect elements.

6. (Currently Amended) The system of claim 5 further comprising:

a first set of disk drives; and

20 a second set of disk drives, and wherein said ~~back-end control element comprises a~~
plurality of back-end ~~controllers~~ control elements including:

a first pair of back-end controllers coupled to said first set wherein each of said first pair
of back-end controllers is coupled to a corresponding one of said pair of interconnect elements;
and

25 a second pair of back-end controllers coupled to said second set wherein each of said
second pair of back-end controllers is coupled to a corresponding one of said pair of interconnect
elements.

7. (Original) The system of claim 1 wherein said interconnect element comprises a PCI bus.

8. (Original) The system of claim 1 wherein said interconnect element comprises:

- a Fibre Channel communication medium; and
- a Fibre Channel SAN switch coupled to said Fibre Channel communication medium.

9. (Original) The system of claim 1 wherein said interconnect element comprises an InfiniBand
5 compliant communication medium.

10. (Original) The system of claim 1 wherein said interconnect element comprises a local area
network communication medium.

10 12. (Original) The system of claim 1 wherein said front-end control element is operable to
perform mapping of logical storage addresses to physical storage addresses for further operations
by said back-end control element.

13. (Original) The system of claim 1 wherein said back-end control further comprises:
15 a RAID parity assist element for RAID parity generation and checking.

14. (Currently Amended) A front-end control element for a storage subsystem comprising:
a host system interface;
a processor coupled to said host system interface to process host system generated I/O
20 requests received through said host system interface; and
a an SAN interface coupled to said processor for coupling said front-end control element
to a plurality of back-end control element elements, wherein said front-end control element is
adapted to be added to the storage subsystem independent of said back-end control elements,
wherein front-end control elements differ in number from said back-end control elements,
25 and
wherein said SAN interface couples the front-end control element to an SAN fabric that
conveys the I/O requests from the front-end control elements to the back-end control elements by
exchange of messages between the front-end and back-end control elements according to address
indicia within the messages and associated with the front-end and back-end control elements, and
30 wherein the front-end control element is substantially devoid of circuits and functions
that control a plurality of I/O devices.

15. (Original) The front-end control element of claim 14 wherein said SAN interface comprises a PCI bus interface.

5 16. (Original) The front-end control element of claim 14 wherein said SAN interface comprises a Fibre Channel communication media interface.

17. (Original) The front-end control element of claim 14 wherein said SAN interface comprises an InfiniBand compliant communication medium.

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18. (Original) The front-end control element 14 wherein said SAN interface comprises a local area network communication medium.

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19. (Currently Amended) A back-end control element for a storage subsystem comprising:
a disk drive interface for coupling said back-end control element to a plurality of disk drives; and

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a an SAN interface coupled to said disk drive interface for coupling said back-end control element to a plurality of front-end control element elements, wherein said back-end control element is adapted to be added to the storage subsystem independent of said front-end control elements,

wherein back-end control elements differ in number from said front-end control elements,
and

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wherein said SAN interface couples the back-end control element to an SAN fabric that conveys the I/O requests from the front-end control elements to the back-end control element by exchange of messages between the front-end and back-end control elements according to address indicia within the messages and associated with the front-end and back-end control elements, and

wherein the back-end control element is substantially devoid of circuits and functions that interface directly with the attached host computer systems and configured,.

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20. (Original) The back-end control element of claim 19 wherein said SAN interface comprises a PCI bus interface.

21. (Original) The back-end control element of claim 19 wherein said SAN interface comprises a Fibre Channel communication media interface.

5 22. (Original) The back-end control element of claim 19 wherein said SAN interface comprises an InfiniBand compliant communication medium.

23. (Original) The back-end control element of claim 19 wherein said SAN interface comprises a local area network communication medium.

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